

Thin Film Flat Panel Off-Axis Solar Concentrator with Flux Distribution, Phase I

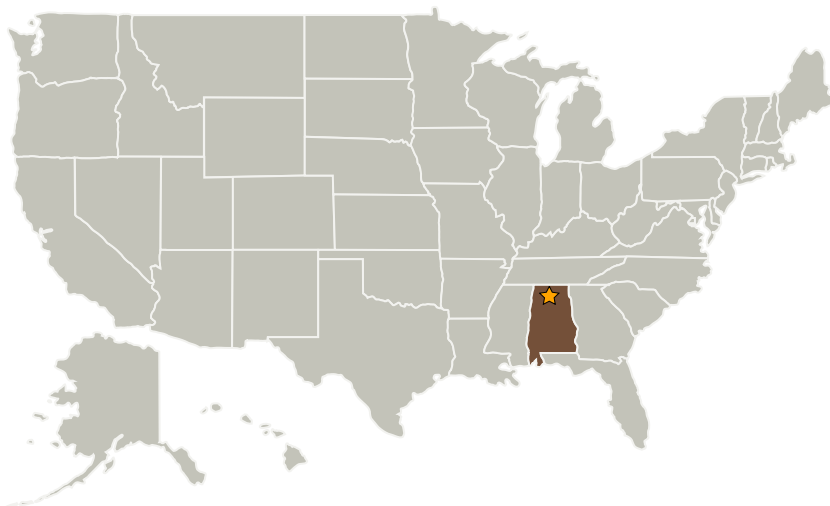
Completed Technology Project (2005 - 2005)



Project Introduction

Relatively small concentric thin film FRESNEL lenses and fresnel-like Multiple Parabolic Reflecting Surface (MPRS) reflectors have been successfully produced from molds machined with diamond turning lathes, which are limited in size to less than 15 feet diameter. This size limitation prevents using this fabrication method for production of molds for operational size space concentrators and off-axis (non-concentric) patterns cannot be produced at all with lathes. UAT has been demonstrated that computer numerical control (CNC) milling machines that can readily machine complex geometries, including any radius of curvature, can be used to produce mold segments representing any portion of any size MPRS. These mold patterns can then be replicated on thin film sheets, which are then appropriately integrated to produce solar concentrators of the desired size. Multiple focal lengths/points, concentration ratios, and controlled flux distribution can be incorporated in a single reflector panel allowing substantial and previously unavailable Wireless Power Transfer System design flexibility. The Phase I program will verify the thin film performance capabilities and scalability of the MPRS concept and the Phase II program will provide a full scale concentrator applicable to Wireless Power Transfer technology for testing and deployment.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Marshall Space Flight Center (MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
United Applied Technologies, Inc.	Supporting Organization	Industry	Huntsville, Alabama

Primary U.S. Work Locations

Alabama

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Larry J Bradford

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
 - └ TX05.2 Radio Frequency
 - └ TX05.2.7 Innovative RF Technologies